

REMARKS

The claims remaining in the application are 1-4, 6-7, and 10-18. Claims 1-4, 6-7, and 10-18 are rejected. Claims 1, 10, and 15 are amended; no new matter is added. The Applicant would like to thank the Examiner for the very quick and courteous Office Action.

35 U.S.C. §103(a) Rejection Over Bellos, et al. in view of Augustin, et al.

The Examiner rejected claims 1-4, 6-7, and 10-18 under 35 U.S.C. §103(a) as being allegedly unpatentable over U.S. Pat. No. 5,853,592 to Bellos, et al. in view of U.S. Pat. No. 5,045,212 to Augustin, et al. for reasons of obviousness and further in view of U.S. Pat. No. 4,835,234 to Valint, et al.

The Examiner asserts that Bellos, et al. discloses treating aqueous, i.e. “water-like fluid phase” streams from oil well production fluids from which oil has been primarily initially separated.

The Examiner contends that Bellos, et al. discloses a composition, for separating water-soluble organics and water essentially consisting of a hydrophilic, hydroxymono-carboxylic acid, such as hydroxyacetic acid or AHA [asserted as inherently having the relatively high pKa of instant claims 2, 11 and 16 and chemical formulation of instant claims 3, 12 and 17], such organic acid optionally constituting essentially all or 99% of the active ingredient. The Examiner finds that Bellos, et al. also disclose that the composition may comprise a “minor amount” of one or more other ingredient such as a demulsifier.

The Examiner further finds that Bellos, et al. teaches that the demulsifiers may either be added separately or in combination with the feed or with the organic or inorganic acid.

The Examiner additionally contends that each of the amounts of each minor ingredients may constitute less than 1% by weight of the composition, hence giving a ratio of AHA to demulsifier of over 50:1, and that the composition may or may not be in the form of an aqueous solution before being mixed with oil/water mixture being treated.

With regard to the criticality of presence/absence of inorganic acid in the composition, Bellos, et al. is alleged by the Examiner to state that inorganic acid may be added to the fluid being treated separately from and after addition of the AHA organic acid.

The Examiner admits that the instant claims all differ in requiring the demulsifier to constitute an anionic polymer. However, the Examiner alleges that Augustin, et al. teaches to separate oil/water emulsions by anionic demulsifiers. The Examiner further notes that specifically, Augustin, et al. teaches in regard to crude oil production streams, to firstly add a cationic demulsifier to separate out much of the oil in a clarified oil phase, and then to further purify an aqueous phase stream from which the oil phase has been initially separated, by sequentially adding an amount of inorganic demulsifier and then an amount of anionic demulsifier that is an anionic polymer to the resulting aqueous phase to further clarify such aqueous phase (referring to col. 1, lines 45-61, col. 2, lines 14-21 and 45-68 and the Table bridging columns 3 and 4 indicating amounts of inorganic demulsifier and anionic polymeric demulsifier added to the aqueous phase).

The Examiner further finds that Valint, et al. also teaches separation of oil-in-water emulsions such as result in crude oil production and in metal working (col. 1, lines 30-55) and teach to sequentially add a cationic polymer or surfactant to break up most of the oil, followed by addition of anionic polymeric flocculants, and in the absence of intermediate steps of addition of inorganic demulsifier as in Augustin, et al.

The Examiner contends that it would have been obvious to one of ordinary skill in the art to have employed an anionic demulsifiers taught by Augustin, et al. as a demulsifier of Bellos, et al. when treating aqueous streams from which the largest quantity of oil has been primarily removed since these demulsifiers are shown to result in separated water phase, having an environmentally permissible very low degree of contamination with oily contaminants, and lower than other well known types of demulsifiers. The Examiner additionally alleges that it would have been obvious to have added, specifically, an anionic, polymeric demulsifier, to the composition applied by Bellos, et al., since Augustin, et al. teaches that this type demulsifier results in an aqueous phase resulting from crude oil production being sufficiently clarified to permit its discharge into an outfall ditch, thus meeting environmental standards. The Examiner contends and “conjectures” that adaptations of Augustin, et al. in the Bellos, et al. method envisions

first adding a small amount of inorganic demulsifier followed by addition of an anionic polymer demulsifier/AHA blend, and then later followed by addition of an inorganic acid.

For claims 8 through 18, the Examiner finds that Bellos, et al. indicates a relatively high ratio of AHA to minor ingredient of demulsifier.

For claims 15-18, the Examiner asserts the composition may comprise also water-like fluid phase or water and other solubilized organics, such as organic wetting agents, that are soluble in the added water. The Examiner finds that Bellos, et al. discloses that if necessary, the composition is added to a fluid mixture being separated, including water and solubilized organics resulting in a mixture encompassing the water and organics being separated as well as the active organic acid ingredient and emulsifier.

For claims 2-4, 6 and 7, the Examiner contends that the claimed “AKA” values and particular claimed organic acids are disclosed in Bellos, et al. while Augustin, et al. generally teaches the specific anionic polymers claimed.

The Examiner further asserts that Augustin, et al. teaches the anionic polymer being copolymers of acrylic or methacrylic acid and acrylamides and esters thereof for claims 4, 7, 13, and 18, and these having a high degree of polymerization as in claims 5, 6 and 14.

The Examiner further found that Applicant’s arguments filed 17 January 2007 were considered but they are not persuasive, particularly when the newly applied Valint, et al. patent is applied in combination with the applied prior art of record.

The Examiner notes that it was argued that Bellos, et al. taken in its entirety teaches that demulsifiers are not desirable or important, especially since their use is not mentioned in the “examples”. The Examiner’s remarks break off mid-sentence at this point.

The Examiner noted that it was argued that there was no suggestion in Augustin, et al. to choose an anionic polymeric demulsifier from amongst a wide array of demulsifiers. However, the Examiner asserts that the forementioned text sections of Augustin, et al., in combination with the newly cited Valint, et al. reference, teach that anionic demulsifier uniquely results in the previously treated and separated aqueous

phase resulting from an original crude oil/water emulsified mixture having a low enough level of residual oil to be discharged to the environment.

The Examiner further found that the Applicant argued that Augustin, et al. requires that anionic co-polymers must be used *together* with cationic demulsifiers and other types of demulsifiers. The Examiner instead contends that Bellos, et al. also discloses treating aqueous phases from which the bulk of the oil has already been removed, rather than oil/water emulsions directly derived from crude oil production. Use of cationic demulsifier and inorganic demulsifier as taught by Augustin, et al. for treating the original oil/water emulsion would thus allegedly be in a separate stage from which the Bellos, et al. composition is added. In addition, in treating the resulting aqueous phase, the Examiner finds that Augustin, et al. teaches to add anionic polymer and inorganic demulsifier at separate times, with the amount of anionic polymer being added being a factor of 10 to 100 times greater than amount of the other demulsifier (Table of Augustin, et al.). The Examiner contends that it's important that Valint, et al. teaches the use of anionic polymer flocculant subsequent to previous uses of cationic flocculant with no intervening use of inorganic demulsifiers or flocculants.

The Examiner noted that the Applicant argued that there is no motivation to choose anionic polymeric demulsifiers in preference to the other demulsifiers taught by Bellos, et al. The Examiner alleges that anionic polymeric flocculants are suggested in preference to the other demulsifiers taught by Augustin, et al.

1. since a chief embodiment of Bellos, et al. concerns treatment of aqueous phases from which the oil phase has already been removed,
2. since anionic polymeric flocculant are used in much larger quantity than other flocculants taught by Augustin, et al. and
3. since both references are ultimately concerned with final adequate removal of organic contaminants sufficient to allow the water use for re-injection into the wells or its disposal without requiring high cost waste treatment procedures.

The Examiner additionally finds that the Applicant argued that Applicant's composition treat oil/water emulsions by use of AHA and anionic polymeric flocculant without a need for use of cationic demulsifier as used in the applied prior art. The Examiner

contended that such argument is not commensurate with the claims in that the claims do not preclude use of cationic demulsifier or other treatment chemical either prior to or after use of the claimed composition, by separate addition or in a separate stage. The Examiner alleges both Bellos, et al. and Augustin, et al. as well as Valint, et al. teach that breaking/separating of oil/water emulsions and subsequent removal of soluble organics from water-like, mainly aqueous phases separated from the original emulsions. The Examiner contends that the claims do not preclude use of any other, diverse, material or composition from the oil/water emulsion or resulting separated phases, both preceding and following treatment with AHA and anionic polymeric demulsifier mix.

The Applicant respectfully traverses.

To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker*, 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992). Applicant respectfully submits that the Examiner has not met this initial burden herein.

The Examiner's attention is respectfully directed to the fact that all of the independent claims herein 1, 10, and 15, and thus by dependency all of the claims, have been amended to recite that the composition has an absence of a cationic emulsion breaker. The Applicant respectfully submits that support for this addition is found in the application as filed, paragraphs [0029] and [0033], and thus its inclusion does not constitute an improper insertion of new matter:

In one non-limiting embodiment of the invention, the AHA and the anionic polymer are the only components present in the inventive compositions that affect the characteristic or property of removing solubilized organics from water-like fluids. No other active components for this purpose are needed. (Paragraph [0029], first two sentences; emphasis added.)

The standard cationic reverse breaker used to remove these emulsions is then *no longer as complementary*, and may then go from being destabilizing to *being restabilizing* (overtreated). It is believed that adding an anionic polymer, *instead of* or in addition to the standard cationic reverse emulsion breaker, along with the AHA overcomes this problem and minimizes the O&G. (Paragraph [0033], emphasis added.)

The Examiner in making the instant rejection finds that the Applicant argued that Applicant's composition treat oil/water emulsions by use of AHA and anionic polymeric flocculant without a need for use of cationic demulsifier as used in the applied prior art, but that such argument is not commensurate with the claims in that the claims do not preclude use of cationic demulsifier or other treatment chemical either prior to or after use of the claimed composition, by separate addition or in a separate stage. Further, Examiner contends that the claims do not preclude use of any other, diverse, material or composition from the oil/water emulsion or resulting separated phases, both preceding and following treatment with AHA and anionic polymeric demulsifier mix. The Applicant now respectfully submits that the phrase added now makes the claims commensurate with the distinguishing argument. The Applicant respectfully requests that the Examiner now give full force to this distinction and argument.

If the Examiner would prefer different distinguishing language, the Applicant would appreciate the Examiner suggesting it. It is the Applicant's position that the claims already precluded the use of a cationic emulsion breaker (or demulsifier) in the previous wording, and that the amendments herein simply make this distinction even more clear. The Applicant is concerned because the claims herein are composition claims, rather than method claims (which were allowed and issued in U.S. Pat. No. 6,695,968), and the precise language to indicate that there is no need for a cationic demulsifier in the composition claims that satisfies the Examiner still may not be present in the claims.

The Applicant in the application as filed, and subsequent thereto, has distinguished the invention from the prior art. As will be established *infra*, the newly cited Valint, et al. reference is simply and only another example of the standard and conventional prior art that the inventive composition is distinct from, novel over and non-obvious from. The Applicant would respectfully point out the following sections from the specification.

Cationic polymers might remove the 10-20% of the WSO associated with microemulsions in the produced water, where such emulsions exist. (Paragraph [0006], last sentence; emphasis added.)

Removing only 10-20% of the WSO is insufficient since 90-80% of the WSO remains, not removed by cationic polymers.

Nonacidic and *cationic compounds have proven unreliable or incompatible with existing water clarifier treatments.* (Paragraph [0009], last sentence; emphasis added.)

Unlike amines and other cationic compounds, the invented compounds have a wide treatment range and are compatible with existing water clarifier treatments.

Unlike the current art that uses cationic compounds in combination with acids, or anionic compounds without acids, this invention optionally employs anionic polymers in combination with acids. (Paragraph [0026], last sentence to first sentence paragraph [0027]; emphasis added.)

In one non-limiting embodiment of the invention, the AHA and the anionic polymer are the only components present in the inventive compositions that affect the characteristic or property of removing solubilized organics from water-like fluids. No other active components for this purpose are needed. (Paragraph [0029], first two sentences; emphasis added.)

Again, the Examiner's attention is respectfully directed to the end of paragraph [0033] previously excerpted, as well as the last sentence in paragraph [0040] discussing the results of GoM Trial result II in Table IV: "Feeding additional anionic polymer (a methacrylic acid : methylmethacrylate : ethylacrylate terpolymer) *at the expense of the cationic REB* [reverse emulsion breaker] *brought the insoluble oil back down to 7 ppm and allowed further reductions in the total O&G.*" (Emphasis added.)

Applicant respectfully submits that Valint, et al. is simply cumulative of the standard practice against which the invention is contrasted, and does not add anything to the deficiencies of Bellos, et al. and Augustin, et al. previously established.

The Examiner's point seems to be that Valint, et al. refers to a prior art process that does not also add an inorganic demulsifier to the mix of cationic and anionic polymers as Augustin, et al. does. However, the Valint, et al. method still requires a cationic polymer be fed first, and only then can the anionic or nonionic polymer flocculate the result. Thus, in the absence of that cationic polymer, and prior to removing any oil it would have treated, would one having ordinary skill in the art choose an anionic polymer, of all things, to combine with the *least essential* part of Bellos, et al.'s WSO treatment? Again, the Applicant respectfully submits that there is nothing in the art that teaches or suggests this, much less a composition that accomplishes the purpose of

removing solubilized organics without the conventional and standard cationic emulsion breaker.

The Applicant respectfully submits that nowhere in Augustin, et al. or Valint, et al. is there any suggestion that anionic polymers do anything except in the *aftermath* of a prior treatment with *cationic* polymers. The claimed composition contains *no cationic polymer*, and the amendments herein further emphasize this distinction. Nor would the claimed composition ever be used following the addition of a cationic polymer or removal of any oil with a cationic polymer, as Valint, et al. refers to, because the oil in place is needed to absorb the desolubilized WSO, and the prior addition of a cationic polymer would either remove the oil or precipitate destructively the anionic polymer in the claimed composition on contact. It may be useful to add a cationic polymer downstream, after the claimed composition has removed the WSO – the stated purpose of the invention having been accomplished, to help remove the oil that absorbed it, but neither Augustin, et al. nor Valint, et al. contemplates any such procedure. They both specifically teach that the cationic oil-removing compound be added *first*, a prelude incompatible with the recited composition, as amended. The claim amendments herein should not be construed as precluding such down stream use.

A. Returning to the primary reference, Bellos, et al. discloses a composition containing a combination of a strong organic acid and a strong mineral acid (Abstract). The mineral acid may be phosphoric acid, phosphorous acid, sulfuric acid, sulfurous acid (column 5, lines 54-59). The organic acid may be oxalic acid, hydroxyacetic acid (glycolic acid), dichloroacetic acid (column 6, lines 25-27). Mineral acids are *always* required by Bellos, et al. as a component of the composition (please also see the claims therein). There is nothing in Bellos, et al. (or in secondary reference Augustin, et al.) that teaches or suggests that the mineral acid is not required in the Bellos, et al. composition.

Again, the invention as claimed herein excludes a mineral acid by virtue of the transitional language “consisting essentially of” language now present in all of the claims. The term “consisting essentially of” excludes ingredients that would materially affect the basic and novel characteristics of the claimed composition, but is open to unlisted ingredients that do not materially affect the basic and novel properties of the invention. *AFG Indus. v. Cardinal IG Co.*, 239 F.3d 1239; 57 U.S.P.Q.2D 1776 (Fed. Cir. 2001).

Applicant respectfully submits that a composition that consists essentially of AHA and an anionic polymer that successfully removes WSOs from water-like fluid phases was *unknown* prior to Applicant's discovery thereof. Such recited composition *excludes* mineral acids. Bellos, et al. *requires* the presence of mineral acids. There is nothing in Bellos, et al. (or in secondary references Augustin, et al. and Valint, et al.) that teaches or suggests that the mineral acid is *not* required in or should be removed from the Bellos, et al. composition. Thus, for this reason alone, no *prima facie* rejection of the claims has been made. The Applicant notes that this point was not addressed by the Examiner in the most recent Action.

B. The Examiner admits that the instant claims all differ in requiring an anionic polymer, and mentions that column 6, line 66 to column 7, lines 12 mention demulsifiers as minor, optional compositions. This portion of Bellos, et al. states:

Minor amounts of other composition may also be added. For example, an acid inhibitor such as a chemfilm or chemsorb may be included to protect metal surfaces in the system from acid attack. Corrosion inhibitors, *demulsifiers*, alcohol and wetting agents, *may* also be included. Therefore, a *typical acid formulation* of premixed phosphoric acid and hydroxyacetic acid might be prepared, by weight, from about 36% water, 42% phosphoric acid (75% aqueous solution), 19% hydroxyacetic acid (70% aqueous solution), about 2% acid inhibitor and less than 1% each of a corrosion inhibitor, a wetting agent and isopropyl alcohol. Thus, the solution comprises by weight about 52% water, 31% phosphoric acid, 13% hydroxyacetic acid and the minor ingredients. (Emphasis added.)

It is significant that although minor amounts of demulsifiers “*may* also be included”, in the “*typical acid formulation*” given, demulsifiers were *not* included. In fact, of the corrosion inhibitors, demulsifiers, alcohol and wetting agents listed that “*may* also be included”, a corrosion inhibitor, an alcohol and a wetting agent were included in the “*typical acid formulation*”, but *not* a demulsifier. Indeed, in the composition of “Additive B” used in the Examples (Examples 1 and 2 in columns 9-10 of Bellos, et al., again a wetting agent, corrosion inhibitor *and* an alcohol were used but *not* a demulsifier.

Applicant thus respectfully submits that although a minor amount of a demulsifier is optional for the acid compositions therein, it is clearly not a very desirable or important part since it is not included in the Examples, nor in a “*typical acid formulation*”. Further,

lines 19-21 of the portion of column 7, lines 17-21, in fact teach: “If high shear conditions are avoided, *a chemical demulsifier will not usually be needed.*” (Emphasis added.)

Thus, the Applicant respectfully submits that one having ordinary skill in the art reviewing the entirety of Bellos, et al. must conclude that a demulsifier is not important or desirable and should not be included. There would thus be no motivation for one of ordinary skill in the art to use a demulsifier of any kind in the Bellos, et al. compositions. For this second reason alone, the Applicant respectfully submits that a *prima facie* case of obviousness has not been made herein. It appears that the Examiner’s discussion of this point in the middle of page 6 of the Action may be inadvertently incomplete.

C. As established, Bellos, et al. discloses only the very *general* possibility of adding “demulsifiers” to his acids; see column 4, line 2; and column 7, line 2, lines 17-21. However, independently of the above point, Bellos, et al. provide *no* indication what type or *kind* of demulsifier is suitable, appropriate or necessary. It is respectfully submitted that there is *no* mention, disclosure or suggestion of anionic, cationic, nonionic, polymeric, monomeric, organic, inorganic, hydrophilic, lipophilic, amphophilic, omni-philic, or any other kind or type of demulsifier. Thus, there is still no reason for one having only *ordinary* skill in the art to choose an *anionic polymer* from that near-infinite universe of possibilities, based on the scant teachings of Bellos, et al. There is no hint or suggestion that any particular class would be any more appropriate than all the other possibilities, much less that an anionic polymer would be appropriate. No teaching, disclosure, mechanism or thesis is provided in Bellos, et al. to make this choice, but the single, highly imprecise, ambiguous word “demulsifier”. It is respectfully submitted that one having ordinary skill in the art has no idea what demulsifier to use or why.

The Examiner admits that Bellos, et al. do not teach or suggest an anionic polymer, and turns to the teachings of Augustin, et al. The Applicant further respectfully submits that the Examiner has not made a *prima facie* case for combining the teaching of Bellos, et al. with that of Augustin, et al. to result in a composition *consisting essentially of* an AHA with *an anionic polymer in the absence of a cationic emulsion breaker* as required by the claims. Augustin, et al. teaches three different demulsifiers. There is no disclosure in any of the references of a composition containing only an anionic polymer

with an AHA as the components establishing the basic and novel properties of the recited composition, particularly now in the more explicit absence of a cationic emulsion breaker. Why would one having *ordinary* skill in the art add only an anionic polymer from Augustin, et al. instead of an inorganic emulsifier? Or instead of an organic cationic emulsifier? Those are also taught by Augustin, et al. From what one can tell there is no answer to these questions because the references give *no* reason why one having ordinary skill in the art would *know* to formulate such a composition.

A reason, suggestion or motivation to combine the teachings of the references *must* be present to support a *prima facie* rejection of obviousness. *Alza Corp. v. Mylan Laboratories, Inc.* 391 F.3d 1365, 1372-1373 (Fed. Cir. 2004). Again, “[T]he examiner has presented no line of reasoning ... as to why the artisan viewing only the collective teachings of the references would have found it obvious to selectively pick and choose various elements and/or concepts from the several references relied on to arrive at the claimed invention.” *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (B.P.A.I. 1985). “The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.” *In re Gordon*, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) cited in *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990).

The Applicant respectfully submits that Valint, et al. provides no help in this regard. Valint, et al. is in fact prior art to Augustin, et al. and Augustin, et al.’s inclusion of inorganic demulsifiers is an attempt to overcome the problems with more conventional approaches such as Valint, et al.’s. The Examiner’s attention is further respectfully directed to the above excerpts from the Applicant’s specification as originally filed which defines procedures such as Valint, et al.’s as part of the prior art that the claimed invention overcomes.

The Examiner contends that one of ordinary skill in the art would allegedly select an anionic polymer from Augustin, et al. to use in the Bellos, et al. composition because:

1. “a chief embodiment of Bellos concerns treatment of aqueous phases from which the oil phase has already been removed,”

2. “anionic polymeric flocculant are used in much larger quantity than other flocculants taught by Augustin” (compare the “Amounts” columns in the Table bridging columns 3 and 4 of this reference), and
3. “both references are ultimately concerned with final adequate removal of organic contaminants, sufficient to allow the water use for re-injection into the wells or it’s [sic] disposal without requiring high cost waste treatment procedures.”

Again, the Applicant respectfully submits that only point 2 is a possible and unique reason for choosing an anionic polymeric demulsifier from the others taught by Augustin, et al. because points 1 and 3 apply to all of the other demulsifiers of Augustin, et al. as well. Thus, if points 1 and 3 are considered, there is still no reason for one having ordinary skill in the art to select an anionic polymer over the organic cationic demulsifiers and organic ionic demulsifiers and inorganic demulsifiers of Augustin, et al.

On the Examiner’s point 2 that Augustin, et al. uses much larger amount of organic anionic polymer than their other two types and therefore it consists predominantly if not essentially of that first type, it is respectfully submitted that this reason as stated by the Examiner is factually incorrect. In the referenced Table bridging columns 3-4, the amount of organic anionic polymer is in “ppm” (parts per million), the others are in “wt%” (weight percent) and thus are not directly comparable. The amount of organic anionic polymer is never more than 1.4% [$1/(50+10+15)$] of the whole. The claims are clearer in this regard — using common units, the relative amounts from claim 1 are:

Organic cationic demulsifier:	30 to 5,000 ppm
Inorganic demulsifier #1:	50 to 1,000 ppm
Inorganic demulsifier #2:	200 to 2,000 ppm
<i>Organic anionic demulsifier:</i>	<i>0.3 to 4 ppm</i>

Here again, the organic anionic demulsifier is at most 1.4% [$4/(30+50+200)$] and, taking the geometric mean, generally less than 0.1% [$1/(400+200+600)$] of Augustin, et al.’s treatment. The claim 1 proportions are consistent with those in column 2, lines 8-13 and 35-41 of this reference. Thus, one having ordinary skill in the art reviewing Augustin, et al. supposedly looking for a demulsifier to use in the Bellos, et al. compositions would in fact be *least* inclined to use an anionic polymer since Augustin, et al. though the proportions taught clearly indicates that an anionic polymer is the *least* important since less

of it is used than the others. It is respectfully submitted that for this additional reason taken alone, the Examiner has not established a *prima facie* case of obviousness of the present claims. Applicant respectfully notes that the Examiner did not address this factual discrepancy, but instead repeated his same previous reasons why one having *ordinary* skill in the art would select the anionic demulsifier.

D. On the examiner's conjectured combination of Augustin, et al. and Bellos, et al., the Applicant respectfully submits even if one were practicing Augustin, et al.'s composition in a process that was then contaminated with some water soluble Oil & Grease of the type removed by Bellos, et al.' composition and thought therefore to add the Bellos, et al.' composition or method on top of Augustin, et al.'s, by adding a mostly mineral acid formula (1:1 to 3:1, column 6, 55-59) to Augustin, et al.'s first step (Bellos, et al.'s method requires a bulk oil phase to be present after the acid is added, so it can *not* be added to Augustin, et al.'s second step where the anionic polymer is added); this seemingly obvious combination would result in *neither* method working, for the reason set out in the Applicant's current disclosure — that the di- and multivalent metal salts of Augustin, et al.'s first step are *incompatible* with Bellos, et al.'s mineral acids, and would thus precipitate a fouling deposit on mixing. In short, one cannot simply combine these two prior art compositions or processes even hypothetically end up with the presently claimed composition. An obviousness rejection is invalid if combining references as the examiner suggests would destroy them for their intended purpose; *Ex parte Westphalen*, 159 U.S.P.Q. 507 (Bd. App., 1967).

In other words, the Applicant respectfully submits that one having ordinary skill in the art would have to “cherry-pick” the *least* essential component of Augustin, et al. and the *less* essential component of Bellos, et al. *and leave out their other components* — because to include them results in the unacceptable formation of a fouling inorganic precipitate, which it is a purpose of the present invention to avoid (see, for instance, paragraph [0033] as published: “Compared to this, the inventive compounds are far less corrosive under usage conditions, equally non-volatile, and completely non-scaling.” and paragraphs [0076] and [0077] and Table VII as published). No reason is given for leaving the other ingredients out or for believing either process would work unless all ingredients were included. That is, no reason is given in the references for excluding the required

mineral acids of Bellos, et al. or for excluding the required organic cationic demulsifiers or the required inorganic demulsifiers of Augustin, et al. Further through the use of the “consisting essentially of” transition language, the claimed composition inherently excludes insoluble metal salts.

The Applicant respectfully submits that the “consisting essentially of” language and the newly added recitation “in the absence of a cationic emulsion breaker” also exclude Augustin’s cationic polymers, since they are incompatible with the claimed anionic polymers, again forming an insoluble coacervate on mixing. *That is why Augustin, et al. adds them in separate steps*, letting one react with the oil before the other is added. Otherwise a precipitate will form. Please also see section H, *infra*.

Valint, et al. does not add any further teaching to rectify these deficiencies. The Examiner cites Valint, et al. for its teaching that there are no intervening inorganic demulsifiers after the use of a cationic flocculant and before an anionic polymer flocculant, but Valint, et al. still teaches a cationic flocculant that is not required or desired or necessary in the claimed composition. For this further reason, taken alone, the Applicant respectfully submits that a *prima facie* obviousness rejection has not been made.

E. The Applicant has discovered that it is the specific combination of anionic polymer to AHA, particularly with an excess of AHA, that gives a uniquely simple composition permitting the simple method already the subject of the parent application that matured into U.S. Pat. No. 6,695,968. The Applicant would respectfully note that all of the present composition claims require an *anionic* polymer. The Examiner essentially admits that Bellos, et al. do not teach or suggest an anionic polymer, and turns to the teachings of Augustin, et al. and Valint, et al.

As established above, the additional recitation of Valint, et al. does not supply the deficiencies of Augustin, et al. Valint, et al. is directed to novel hydrophobically associating terpolymer compositions containing *cationic* functionality (Abstract therein). Indeed, Valint, et al. is almost entirely focused on and concerned with cationic polymers, and contains very little teaching with respect to anionic polymers. The Applicant would respectfully direct the Examiner’s attention to the last portion, column 9, lines 40-59, of a section noted by the Examiner:

Cationic polymers or surfactants are used to neutralize the surface charge. Once the charge is neutral the droplets may begin to approach each other and agglomerate or coalesce since the electrostatic repulsion responsible for a significant portion of the emulsion's stability has been eliminated. Eventually large floc formation or liquid oil formation occurs. Once the droplets begin to flocculate they can begin to float since they are much larger than the starting oil droplets. As they grow in size they will rise to the surface of the water at a faster rate. If a high molecular weight cationic polymer is used for charge neutralization, the polymer will accelerate the separation of the oil since the polymer is attracted to the oil droplet by coulombic attraction, hydrogen bonding or other mechanisms. In some cases low molecular weight cationic chemicals are added for charge control and then high molecular weight nonionic or anionic polymers are added next to cause polymer bridging between droplets and accelerate floc formation. (Emphasis added.)

The Applicant respectfully submits that this is exactly the kind of conventional treatment using cationic polymers that the inventive composition is distinct from. The Applicant again respectfully directs the Examiner's attention to the excerpts from the specification quoted above. The further amendments to the claims that the composition has "an absence of a cationic emulsion breaker" additionally distances the claimed invention from the teachings of Valint, et al. and Augustin, et al. Valint, et al. only teaches that their cationic polymers are absolutely necessary in a waste water treatment, *e.g.* (col. 1, lines 30-55 therein).

It is again respectfully submitted that Augustin, et al. does not clarify the situation or add anything to understanding of it for one having only *ordinary* skill in the art. Augustin, et al. teaches that anionic acrylic copolymers are included in the class of organic anionic demulsifiers that *must be used in combination with inorganic* anionic demulsifiers, organic *cationic* demulsifiers, and *inorganic cationic* demulsifiers in the sequence specified (not all together) to remove insoluble oil from water. Augustin, et al. is consistent with the conventional wisdom in teaching that all must be used in combination and correct sequence (not mixed together except as noted), and repeats this combination many times.

There is no mention or implicit inclusion in Augustin, et al. of *any* kind of acid, organic or inorganic, among the variety of species taught. Bellos, et al. in contrast, *requires* the use of a mineral acid. For this additional reason, similar to the reason

established in section D *supra*, combining the references would destroy them for their intended purposes since one requires a mineral acid and the other does not. Thus, it is respectfully submitted that there is no reason for one of only *ordinary* skill to pluck out from this broad, almost all-inclusive list of Augustin, et al. some anionic acrylic copolymers taught in very minor proportions to use without the other three types of chemicals and form a combination instead with something else entirely different.

The Applicant *does* understand that Augustin, et al. is using them sequentially. Applicant's position is that there is nothing in the references that teaches a composition as claimed containing AHA (*e.g.* glycolic acid) together with an anionic polymer as the only effective components of a composition necessary to remove solubilized organics) (claims 1-14) or a composition as claimed containing an AHA together with an anionic polymer together with at least one solubilized organic and a water-like fluid phase (claims 15-18). For these additional reasons taken alone (or together with the previous ones), the Applicant respectfully submits that a *prima facie* obviousness rejection has not been made.

F. It is respectfully submitted that the Examiner may not realize that anionic polymers *per se* do not remove oil emulsified in water. No one, particularly Valint, et al., Augustin, et al. or Bellos, et al. ever claims or teaches that they do or claims or teaches that they ever do – unless, of course, a cationic surface modifier is added *first*. The anionic polymers are “known demulsifiers” *only* in the context or matrix of a *previously cationized* emulsion – for *exactly* the reasons taught by Valint, et al. in the excerpt quoted above from column 9, lines 40-59.

As explained in the previous Amendment, the reason is that droplets of petroleum oil in water have an anionic surface charge (as shown, for example, by their negative zeta potential or their titration with cationic dyes). It is respectfully submitted that this is common knowledge. The Examiner's attention is respectfully directed to Valint, et al., column 9, lines 36-45, cited by the Examiner in the Action:

By way of example, *oil droplets emulsified in water generally carry a negative surface charge or zeta potential* which helps to stabilize the emulsion, keeping the droplets dispersed and making them difficult to resolve or break. *Cationic polymers or surfactants are used to neutralize the surface charge*. Once the charge is neutral the droplets may begin to approach each

other and agglomerate or coalesce since the electrostatic *repulsion* responsible for a significant portion of the emulsion's stability has been *eliminated*. (Emphasis added.)

That is, unless the surface is somehow first cationized, anionic polymers are repelled from the surface and do not interact with it to create mutual attraction of droplets. Applicant respectfully submits that a composition that consists essentially of AHA and an anionic polymer that has an absence of a cationic emulsion breaker which successfully removes WSOs from water-like fluid phases was unknown prior to Applicant's discovery thereof.

The whole novelty of the Augustin, et al. treatment is said to be finding a way to use the otherwise ineffective anionic polymers, instead of only the usual cationic polymers, as represented by the newly cited and entirely conventional Valint, et al. reference. Please see Augustin, et al. column 1, lines 15-20. This is done in Augustin, et al. by first cationizing the emulsion with cationic, surface adsorbing, divalent metal cations:

Until now, o/w emulsions have been separated using single-step processes in which to the o/w emulsions are added either inorganic demulsifiers or organic cationic demulsifiers (cf., for example, EP-A-186,029) or else first organic cationic demulsifiers are added followed by inorganic demulsifiers (modified Windsor process. [sic])

The surface groups are converted from --COO^- to --COOCa^+ . Only then will the anionic polymers perform. Thus, while it is true that Augustin, et al.'s anionic "demulsifier results in an aqueous phase ... sufficiently clarified to permit its discharge" within the context of the teaching, Augustin, et al. teaches *only* that *following a pretreatment with a multivalent metal cation salt*, an anionic polymer that would not *otherwise* have clarified water at all, produces sufficient clarity for discharge.

Moreover, (in disagreement with and contrast to Bellos, et al.) the claimed composition should be added before the bulk oil and water are separated (Augustin, et al.'s Step 1) in order to remove water solubilized organics. Augustin, et al.'s anionic polymer must be added after the bulk oil and water separation and *after* a series of three *other* demulsifiers have also been added. It should be understood that Augustin, et al.'s treatment would *not* work if the anionic polymer were added as the *first* composition in

mixed production rather than the *last* composition just prior to discharge. Valint, et al. is consistent with this understanding. The Applicant respectfully submits that it is *not* obvious to one having *ordinary* skill in the art that the claimed co-formulation with an α -hydroxy hydrophilic acid would allow the addition order and substrate treated to be completely *reversed* to the manner of Bellos, et al. It is the novel and surprisingly simple composition claimed herein that permits these methods to work and be correspondingly simple. The methods are discussed herein only for the purpose of emphasizing the unique nature of the claimed composition.

It is respectfully submitted that an important part of the Applicant's invention is the discovery is that, while acids are generally considered to be anionic (thus polyacids are anionic polymers), if the proton donating power is strong enough to protonate the prevailing surface acid (through α -hydroxy activation) and the conjugate base is hydrophilic enough (specific supporting criteria are given in the specification) to stay hydrated and not adsorb onto the surface, then these supposedly *anionic* additives can actually have a *cationizing* effect of a magnitude similar to the pre-addition of multivalent cation salts – but *without* having to employ these cationic salts. It is respectfully submitted that this idea is not referenced elsewhere in the literature and in particular not suggested, disclosed or hinted at by the cited art; thus these unique and spare compositions are Applicant's unique and non-obvious contribution to the art.

To stress this important understanding of the invention, claim 1 was previously amended to recite that the weight ratio of AHA to anionic polymer in the composition ranges from over 50:1 to 10,000 to 1. The greater presence of the AHA emphasizes its importance to the claimed composition as noted above. And further, the claims have been amended herein to recite that the composition has an absence of a cationic emulsion breaker.

For these additional reasons, taken alone or together with the others established previously, Applicant respectfully submits that a *prima facie* obviousness rejection has not been made.

G. Applicant further respectfully submits that the Examiner has not made a *prima facie* case for combining the teaching of Bellos, et al. with that of Augustin, et al. and/or Valint, et al. to result in a composition *consisting essentially of* an AHA with an

anionic polymer in the absence of a cationic emulsion breaker as required by the claims. Augustin, et al. teaches three different demulsifier classes. Valint, et al. requires a cationic polymer. Bellos, et al. requires the use of a strong organic acid and a strong mineral acid.

“Our reviewing courts have often advised the Patent and Trademark Office that it can satisfy the burden of establishing a *prima facie* case of obviousness *only* by showing some *objective* teaching in either the prior art, or knowledge generally available to one of ordinary skill in the art, that ‘would lead’ that individual ‘to combine the relevant teachings in the references.’ Accordingly, an examiner *cannot* establish obviousness by locating references which describe aspects of a patent applicant’s invention without *also* providing *evidence of the motivating force which would impel one skilled in the art to do what the patent applicant has done.*” (Citations omitted; emphasis added.) *Ex parte Levengood*, 28 U.S.P.Q.2d 1300, 1302 (B.P.A.I. 1993).

The Applicant would respectfully submit that there is nothing in Bellos, et al., Augustin, et al. or Valint, et al. or the combination thereof that would impel one having *ordinary* skill in the art to make the limited, “consisting essentially of” 2-component combination supposed obvious by the Examiner. There is *no* hint in Augustin, et al. that that the class of demulsifier disclosed as being used in the least amount would be more appropriate than all the others mentioned. There is *no* hint in Valint, et al. that the anionic polymer barely mentioned should be used *instead of* the required cationic polymer that dominates the reference. There is no mechanism or thesis provided to connect the three references, but the single, highly ambiguous general word “demulsifier” in Bellos, et al., it is respectfully submitted – and even then Bellos, et al. prefers not to use an emulsifier of any type in a “typical” acid formulation or their Examples. Nor is there any reason or motivation given in any reference that would *impel* one having ordinary skill in the art to delete the mineral acid taught as required by Bellos, et al. Again, one having ordinary skill in the art essentially has no idea what to use or why if the references are supposedly combined – for which there is no clear motivation.

H. With respect to the Examiner’s comment that Applicant’s argument that Applicant’s composition does not require the use of cationic demulsifiers not being commensurate with the claims because a cationic demulsifier could be used before or

after the claimed composition, the Applicant respectfully submits that the claims have now been so amended. The claimed compositions recite all necessary components to function. No cationic demulsifier or other treatment chemical from Augustin, et al., Valint, et al., or other source is necessary or recited to be effective to accomplish the invention goals. If the Examiner finds the language added to the amended independent claims herein to be unsuitable, the Applicant respectfully invites the Examiner to suggest alternate, acceptably distinguishing language.

For all of these reasons it is respectfully submitted that the Examiner has not made a *prima facie* case of obviousness. Reconsideration of the claims and withdrawal of the rejection are respectfully requested.

It is respectfully submitted that the arguments and amendments presented above overcome the rejections and place the claims in condition for allowance. Reconsideration and allowance of the claims are respectfully requested. The Examiner is respectfully reminded of his duty to indicate allowable subject matter. The Examiner is also invited to call the Applicant's attorney at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,
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